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09/771,137	01/24/2001	Bruce A. Judson	PA000220	6736

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Qualcomm Incorporated
Patents Department
5775 Morehouse Drive
San Diego, CA 92121-1714

EXAMINER

LE, DUY K

ART UNIT	PAPER NUMBER
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2685

DATE MAILED: 11/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/771,137

Applicant(s)

JUDSON, BRUCE A.

Examiner

Duy K Le

Art Unit

2685

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4, 5 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-2, 4, 9-14, 16, and 21-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Weaver et al. (U.S. Patent 6,421,005).

As to claim 1, the Weaver reference discloses a method comprising the steps of:

using an antenna beam pattern to send a communication signal to a user (“the beam patterns 30A-C as shown in FIG. 1 dictate the area or sector from which information can be received from wireless communication units and to which information can be sent” (Col. 1, lines 28-31));

determining a statistic using a control signal from said user (“based upon data gathered from wireless mobile units using the cylindrical antenna arrays 100, such as position and signal information (such as transmit power, for example) monitored and gathered at a remote location for example; the number of antenna components, antenna pattern, and beam configuration, beam orientation, or even dynamic down-tilting and up-tilting are easily achieved by remotely controlling controller 200” (Col. 4, lines 28-35). “By providing such location or position information along with the signal information (such as signal strength, measurements, transmit

power, etc.), antenna component configuration adjustment can be made to minimize interference and call droppage and maximize coverage” (Col. 5, line 63 to Col. 6, line 1));

utilizing said statistic to narrow said antenna beam pattern and to direct said antenna beam pattern to said user (“for example, the controller 200 controls the cylindrical antenna array 100 to adjust beam configuration for example, by narrowing beam width of one antenna component of the cylindrical array 100 and widening beam width of another antenna component within the same cell” (Col. 7, lines 33-37). “Narrowing the beam width of an antenna component of a heavily loaded sector while widening the beam width of the antenna component of a lightly loaded sector, as one way of adjusting beam component configuration” (Col. 9, lines 10-15)).

As to claim 2, the Weaver reference discloses the method of claim 1 further comprising storing said antenna beam pattern after said utilizing step (“in “tuning” or reconfiguring the antenna components of the cylindrical antenna array 100, neighbor sets are developed and stored in memory 220 of controller 200” (Col. 4, lines 55-57)).

As to claims 4 and 16, the Weaver reference discloses the control signal is a power control signal (“based upon data gathered from wireless mobile units using the cylindrical antenna arrays 100, such as position and signal information (such as transmit power, for example) monitored and gathered at a remote location for example; the number of antenna components, antenna pattern, and beam configuration, beam orientation, or even dynamic down-tilting and up-tilting are easily achieved by remotely controlling controller 200” (Col. 4, lines 28-35)).

As to claim 9, the Weaver reference discloses the method of claim 1 wherein said antenna beam pattern is formed using an adaptive antenna array (“cylindrical base station antenna arrays

which are initially set up based upon mathematical parameters, and which can easily be adjusted or adapted in various ways so as to minimize interference and maximize coverage within a cell and between neighboring cells” (Col. 3, lines 35-39)).

As to claims 10 and 22, the Weaver reference discloses the communication signal is sent over a forward link of a wireless communication system (“the beam patterns 30A-C as shown in FIG. 1 dictate the area or sector from which information can be received from wireless communication units and to which information can be sent” (Col. 1, lines 28-31). As interpreted by examiner, forward link refers to transmission from the base station to a mobile unit. The beam patterns transmit information from the base station to a mobile unit).

As to claims 11 and 23, the Weaver reference discloses the wireless communication system is a wideband code division multiple access communication system (“to fully take advantage of the large capacity and essentially soft limit provided to wireless systems by CDMA technology for example, the load on each of the antenna components of the cell is monitored” (Col. 7, lines 25-28)).

As to claim 12, Figure 4 in Weaver shows a system comprising:

a control signal monitoring module 200 configured to access a control signal from a user (“the controller 200 includes a central processing unit (CPU) 210, and a memory 220. The CPU 210 receives information, such as information for reconfiguring antenna components, in a wireless manner through fixed signal 230 and/or through connections to other components which receive the position and signal information from the wireless mobile units” (Col. 4, lines 42-48));

a signal statistic computation module 200 configured to determine a statistic from a sequence of monitored signals output by said signal monitoring module (“this position and signal

for a given base station is preferably received and monitored in a location remote to a controller 200 of the base station. Using this information, antenna component configuration parameters for reconfiguring antenna components of a corresponding cylindrical antenna array 100 are determined” (Col. 6, lines 1-6));

an antenna beam pattern optimizing module 200 configured to utilize said statistic to narrow an antenna beam pattern to be directed to said user (“for example, the controller 200 controls the cylindrical antenna array 100 to adjust beam configuration for example, by narrowing beam width of one antenna component of the cylindrical array 100 and widening beam width of another antenna component within the same cell” (Col. 7, lines 33-37)).

As to claim 13, the Weaver reference discloses the system of claim 12 further comprising an adaptive antenna array module configured to output and direct said antenna beam pattern to said user (“cylindrical base station antenna arrays which are initially set up based upon mathematical parameters, and which can easily be adjusted or adapted in various ways so as to minimize interference and maximize coverage within a cell and between neighboring cells” (Col. 3, lines 35-39)).

As to claim 14, Figure 1 in Weaver discloses the system of claim 12 further comprising an antenna beam pattern storing module 220 configured to store said antenna beam pattern (“in “tuning” or reconfiguring the antenna components of the cylindrical antenna array 100, neighbor sets are developed and stored in memory 220 of controller 200” (Col. 4, lines 55-57)).

As to claim 21, the Weaver reference discloses the system of claim 12 wherein said antenna beam pattern is used to send a communication signal to said user (“the beam patterns

30A-C as shown in FIG. 1 dictate the area or sector from which information can be received from wireless communication units and to which information can be sent" (Col. 1, lines 28-31)).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,421,005 to Weaver et al. in view of Densmore et al. (U.S. Patent RE37,218).

As to claims 3 and 15, the Weaver reference discloses the method of claim 1 and the system of claim 12. However, it does not disclose the utilizing step comprises using a dithering algorithm to optimize said antenna beam pattern. The Densmore reference teaches using a dithering algorithm ("the dithering algorithm referred to above involves rocking the antenna sinusoidally in azimuth angle 1 deg in each direction at a 2 Hz rate. The satellite sends a special pilot signal for antenna tracking. By correlating the received pilot signal level sensed by the receiver with the commanded dithering of the antenna angle, the antenna controller computer determines the sign and magnitude of any pointing error" (Col. 8, lines 58-65)).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method and system of Weaver to have the utilizing step comprises using a dithering algorithm to optimize said antenna beam pattern, as taught by Densmore, in order to dynamically adjust the beam configuration to minimize interference.

5. Claims 6-8 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,421,005 to Weaver et al. in view of Spaling et al. (U.S. Patent Application Publication 2002/0077111 A1).

As to claims 6 and 18, the Weaver reference discloses the method of claim 1 and the system of claim 12. However, it does not disclose the statistic is an average of the control signal over a specified interval of time. The Spaling reference teaches an average of values over a specified interval of time. "An averager 202 (Figure 7) may be used optionally to average the value generated by the counter 200" (page 5, col. 2, paragraph [0046], lines 6-8). "The average is taken of values received within a certain time window" (page 5, col. 2, paragraph [0047], lines 11-12).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method and system of Weaver wherein the statistic is an average of the control signal over a specified interval of time, as taught by Spaling, in order to effectively smooth out any abrupt, momentary changes in values.

As to claims 7 and 19, the Weaver reference discloses the method of claim 1 and the system of claim 12. However, it does not disclose the statistic is a running average of the control signal. The Spaling reference teaches computing a running average. "A sliding averager 216 (Figure 8) may be used to average the value generated by the counter 210 using a sliding window technique" (page 5, col. 2, paragraph [0047], lines 7-9). "As the window "moves" in time, older values are discarded and newer values are observed" (page 5, col. 2, paragraph [0047], lines 12-14).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method and system of Weaver wherein the statistic is a running average of the control signal, as taught by Spaling, in order to effectively smooth out any abrupt, momentary changes in values.

As to claims 8 and 20, the Weaver reference discloses the method of claim 1 and the system of claim 12. However, it does not disclose the statistic is a weighted average of the control signal. The Spaling reference teaches a weighted average. "FIG. 9 illustrates another example implementation of the invention where the transmit power control commands are "weighted" to reflect the different degrees to which those commands will likely impact the cell load/congestion condition" (page 6, col. 1, paragraph [0051], lines 1-5). "The weights are multiplied by their corresponding transmit power control command, either positive or negative. The weighted commands are selectively added in the weighted TPC command processor 302 to generate a transmit power control command "up" value and a transmit power control command "down" value" (page 5, col. 1, paragraph [0052], lines 11-16).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method and system of Weaver wherein the statistic is a weighted average of the control signal, as taught by Spaling, in order to reflect the different degrees each control signal measurement will likely impact the overall average value.

6. Claims 5 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,421,005 to Weaver et al. in view of Padovani et al. (U.S. Patent 6,574,211).

As to claims 5 and 17, the Weaver reference discloses the method of claim 1 and the system of claim 12. However, it does not disclose the control signal is a data rate control signal.

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The Padova reference teaches the control signal is a data rate control signal "the C/I that any given user's mobile station achieves determines the information rate that can be supported for this particular link from the base station to the user's mobile station" (Col. 3, lines 9-12). "In the exemplary embodiment, at every time slot, the mobile station transmits to the selected base station on a dedicated data request (DRC) channel a request for transmission at the highest data rate which the measured C/I can reliably support. The selected base station transmits data, in data packets, at a data rate not exceeding the data rate received from the mobile station on the DRC channel" (Col. 4, lines 34-41).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method and system of Weaver wherein the control signal is a data rate control signal, as taught by Padova, in order to communicate from the mobile station to the serving base station the optimum data rate that can be supported.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

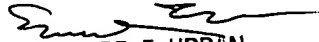
- a. Weaver et al. (U.S. Patent 6,400,335) discloses dynamic load sharing system and method using a cylindrical antenna array.
- b. Forssen et al. (U.S. Patent 5,848,358) discloses intracell handover with antenna arrays.
- c. Reudink et al. (U.S. Patent 5,889,494) discloses antenna deployment sector cell shaping system and method.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Duy K Le whose telephone number is 703-305-5660. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward F Urban can be reached on 703-305-4385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Duy Le
November 14, 2003


EDWARD F. URBAN
SUPERVISORY PATENT EXAMINER
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